with a density of 15-25 kg/m3, preferably 21 kg/m3. Resin content following the first calender is 200-300 g/m2. Covering layer (16, 18) weights are 160-200, preferably 186 g/m2. Outer and inner coatings have weight 10-30 g/m2 preferably 20 g/m2.

USE - To make a reinforcing internal lining for a vehicle roof.

ADVANTAGE - The new lining is even lighter in weight, and has high dimensional stability. The foam used is quite soft and is brought to shape with little resistance. Once set there is little or no tendency to spring back to original shape. Resin achieves both stiffening in the required shape, and adhesion to the coverings. Stiffness can be varied, and with it, acoustic damping properties, providing selectivity against specific frequencies. Use of soft foam reduces costs and weight. No additional waterproof coating is required, saving further cost, weight and materials, when lining with kraft paper. No blow holes are formed. This and further features are discussed in the text of the disclosure.

DESCRIPTION OF DRAWING(S) - A schematic side view, shows the production line.

foamed panel or band of material (14)
covering layers sandwiching foam (16, 18)
resin material adherent to covering layers (28)
calender with adjustable nip, pressing out surplus resin (30)
second calender (34)
hot pressing mold (40)
pp; 6 DwgNo 3/3

Technology Focus:

TECHNOLOGY FOCUS - POLYMERS - The foam is based on a soft polyurethane or a polyester. The hardening- and adhesive resin is di-isocyanate. The catalyst is a 10:1 water/amine mixture. Further materials include kraft liner paper or fleece, and glass or carbon fibers for reinforcement. Covering layers have external and internal coatings of polyolefins

Title Terms: PRODUCE; ROOF; REINFORCED; INTERNAL; CLAD; VEHICLE; PASS; SOFT ; FOAM; THROUGH; RESIN; ADHERE; COVER; LINING; HOT; PRESS; FORM; LIGHT; STRONG; RIGID; HIGH; DIMENSION; STABILISED

Derwent Class: A95; P73; Q17; Q22

International Patent Class (Main): B32B-005/18; B62D-025/06

International Patent Class (Additional): B32B-005/24; B32B-027/12; B32B-031/00; B60R-013/02

File Segment: CPI; EngPI

Manual Codes (CPI/A-N): A11-B09A; A12-S02; A12-S04A3; A12-T04B

Polymer Indexing (PS):

<01>

001 018; P1592-R F77 D01; S9999 S1309-R

002 018; P0839-R F41 D01 D63; S9999 S1309-R

003 018; ND01; ND07; N9999 N7192 N7023; N9999 N7147 N7034 N7023; N9999 N7090 N7034 N7023; K9676-R; K9483-R; K9574 K9483; N9999 N7205 N7023 ; Q9999 Q7830; Q9999 Q7818-R; Q9999 Q9234 Q9212; Q9999 Q9289 Q9212; Q9999 Q9303 Q9212; N9999 N6600; N9999 N5721-R; K9518 K9483; K9563 K9483; N9999 N6940 N6939; B9999 B4988-R B4977 B4740; B9999 B5129 B4977 B4740; B9999 B4079 B3930 B3838 B3747; B9999 B4013 B3963 B3930 B3838 B3747; B9999 B3985 B3974 B3963 B3930 B3838 B3747; B9999 B3509 B3485 B3372; B9999 B5141 B4740; B9999 B4842 B4831 B4740; B9999 B3827 B3747; K9892

004 018; G2891 D00 Si 4A; R05086 D00 D09 C- 4A; A999 A419; S9999 S1070-R; A999 A771

005 018; D01 F07-R F73; R01740 G2335 D00 F20 H- O- 6A; A999 A771; A999 A157-R

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S4 1 PN=DE 19847804

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DIALOG(R)File 351:Derwent WPI

013122924 **Image available**

WPI Acc No: 2000-294795/200026

XRAM Acc No: C00-089224
XRPX Acc No: N00-221159

Vehicle roof interior stiff ning reinforcement is produced by coating cut foam sheets with a thermosetting r action adhesive, applying cover layers and pressing in a heat d molding tool

Patent Assignee: JOHNSON CONTROLS HEADLINER GMBH (JOHN-N)
Inventor: BODWING F; HAERTLING P; KOENIGER U; LOUIS D
Number of Countries: 025 Number of Patents: 002
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
EP 993935	A2	20000419	EP 99120455	A	19991014	200026	B
DE 19847804	C1	20000511	DE 1047804	A	19981016	200028	

Priority Applications (No Type Date): DE 1047804 A 19981016
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
EP 993935	A2	G	8	B32B-005/18	
	Designated States (Regional): AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI				
DE 19847804	C1			B62D-025/06	

Abstract (Basic): EP 993935 A2

NOVELTY - Interior vehicle roof reinforcement production, by coating cut foam sheets (14) with a thermosetting reaction adhesive (20, 22), applying cover layers (16, 18) and pressing in a heated molding tool, is new.

DETAILED DESCRIPTION - Production of a vehicle roof reinforcement, for application to the interior face of the roof skin (10), comprises cutting sheets (14) of constant thickness from a foam block, coating both sides of each sheet with a reaction adhesive (20, 22), applying outer cover layers (16, 18) and then pressing the assembly in a heated tool to shape the reinforcement contour and to cure the adhesive.

USE - For interior stiffening of vehicle roofs.

ADVANTAGE - The process permits the use of a low density foam material for achieving weight, material and cost savings compared with prior art sandwich materials formed by a strip foaming process, facilitates molding of the reinforcement to the final shape since the cover layers are not bonded before shaping, and avoids the need for a water-tight coating on the foam layer and thus avoids any asymmetry.

DESCRIPTION OF DRAWING(S) - The drawing shows a schematic view of a layer structure produced by the process of the invention.

Foam layer (14)
Cover layers (16, 18)
Reaction adhesive layers (20, 22)
pp; 8 DwgNo 2/3

Technology Focus:

TECHNOLOGY FOCUS - POLYMERS - Preferred material: The foam is a semi-rigid polyurethane foam, the cover layers have external polyolefin coatings and the adhesive is a PU, especially a 1-K-PU, system adhesive.

Title Terms: VEHICLE; ROOF; INTERIOR; STIFFEN; REINFORCED; PRODUCE; COATING ; CUT; FOAM; SHEET; THERMOSETTING; REACT; ADHESIVE; APPLY; COVER; LAYER; PRESS; HEAT; TOOL
Derwent Class: A17; A25; A95; P73; Q17
International Patent Class (Main): B32B-005/18; B62D-025/06
International Patent Class (Additional): B32B-005/24; B32B-027/12; B32B-031/00; B60R-013/02
File Segment: CPI; EngPI
Manual Codes (CPI/A-N): A11-C01C; A12-T04D
Polymer Indexing (PS):

<01>
001 018; P1592-R F77 D01; S9999 S1309-R; S9999 S1434
002 018; ND01; ND07; N9999 N5721-R; N9999 N6600; K9676-R; Q9999 Q9289 Q9212; K9892; B9999 B4079 B3930 B3838 B3747; N9999 N6440-R; B9999 B4842 B4831 B4740; K9483-R; K9574 K9483; N9999 N6177-R; N9999 N6111 N6097; K9416
003 018; B9999 B5243-R B4740
<02>
001 018; H0328; P1592-R F77 D01; L9999 L2391; L9999 L2073; M9999 M2073

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  *002* 018; Q9999 Q6644-R
  *003* 018; ND01; ND07; N9999 N5721-R; N9999 N6600; K9676-R; Q9999 Q9289
        Q9212; K9892; B9999 B4079 B3930 B3838 B3747; N9999 N6440-R; B9999
        B4842 B4831 B4740; K9483-R; K9574 K9483; N9999 N6177-R; N9999 N6111
        N6097; K9416
  <03>
  *001* 018; G0033-R G0022 D01 D02 D51 D53; H0000; H0011-R; P1150
  *002* 018; ND01; ND07; N9999 N5721-R; N9999 N6600; K9676-R; Q9999 Q9289
        Q9212; K9892; B9999 B4079 B3930 B3838 B3747; N9999 N6440-R; B9999
        B4842 B4831 B4740; K9483-R; K9574 K9483; N9999 N6177-R; N9999 N6111
        N6097; K9416
  *003* 018; K9712 K9676; Q9999 Q7114-R
?ss pn=de 4015739
      S5       1  PN=DE 4015739
?t s5/9/all

 5/9/1
DIALOG(R)File 351:Derwent WPI
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008843327
WPI Acc No: 1991-347342/ 199148
XRAM Acc No: C91-149752
  Laminated polypropylene composites - by heating one surface of solid
  polypropylene substrate and pressing plasticised surface obtd. onto layer
  of polypropylene foam
Patent Assignee: HOECHST AG (FARH  )
Inventor: GUBITZ F; ORTH R; VOWINKEL H; GUEBITZ F
Number of Countries: 018  Number of Patents: 009
Patent Family:
Patent No     Kind   Date     Applicat No     Kind   Date      Week
DE 4015739    A    19911121  DE 4015739      A    19900516  199148  B
WO 9117882    A    19911128                                 199150
PT 97677      A    19920331                                 199216
EP 528879     A1   19930303  EP 91909104     A    19910513  199309
                             WO 91EP884      A    19910513
JP 5508360    W    19931125  JP 91508744     A    19910513  199401
                             WO 91EP884      A    19910513
US 5300361    A    19940405  WO 91EP884      A    19910513  199413
                             US 92938042     A    19921112
EP 528879     B1   19940622  EP 91909104     A    19910513  199424
                             WO 91EP884      A    19910513
DE 59102034   G    19940728  DE 502034       A    19910513  199429
                             EP 91909104     A    19910513
                             WO 91EP884      A    19910513
ES 2056650    T3   19941001  EP 91909104     A    19910513  199440

Priority Applications (No Type Date): DE 4015739 A 19900516
Cited Patents: EP 231013; GB 1226053; GB 1356780; GB 1346780
Patent Details:
Patent No  Kind Lan Pg   Main IPC     Filing Notes
WO 9117882    A
   Designated States (National): JP KR PL US
   Designated States (Regional): AT BE CH DE DK ES FR GB GR IT LU NL SE
EP 528879     A1 G  11 B32B-005/18   Based on patent WO 9117882
   Designated States (Regional): BE DE DK ES FR GB GR IT NL SE
JP 5508360    W      4 B29C-065/02   Based on patent WO 9117882
US 5300361    A      3 B32B-031/26   Based on patent WO 9117882
EP 528879     B1 G   4 B32B-005/18   Based on patent WO 9117882
   Designated States (Regional): BE DE DK ES FR GB GR IT NL SE
DE 59102034   G        B32B-005/18   Based on patent EP 528879
                                     Based on patent WO 9117882
ES 2056650    T3       B32B-005/18   Based on patent EP 528879

Abstract (Basic): DE 4015739 A
        A process is claimed for the prodn. of a composite prod. (I) from
    polypropylene (PP) by bonding solid substrate layer(s) (A) with a layer
    of foam (B); the novelty is that (only) the surface of (A) which faces
    (B) is plasticised by heating and the two are then brought together
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